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SEVENTH MONTHLY PROGRESS REPORT

SEPTEMBER 1964

MICRODENSITOMETER CAPABILITY AND INTERPRETATION STUDY

STATINTL This report covers the seventh month's activities on a program which consists of a study of microdensitometer capability and interpretation techniques. The three objectives of the program are: (1) the establishment of techniques which will enable a microdensitometer operator to use the instrument to its maximum capability and to interpret the data therefrom accurately (the results of this task will be published as a manual); (2) a survey of existing instruments to study the most recent developments in microdensitometry; and (3) a study of the feasibility and effectiveness of various advances in the state-of-the-art.

Each of the three tasks has been continued during the period covered by this report. As of the end of the month, the percentage expenditure to date was 85%.

I. Mensuration Procedures and Data Interpretation

Effort on Task I has been on both mensuration procedures and data interpretation techniques. The mensuration procedures are being written in the form of a handbook. Several of the sections have been completed in rough draft form.

The effort on data interpretation has been a study of the effect, on average density determination, of nonlinear density integration.

Declass Review by NIMA/DOD

II. Equipment Capability

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Three microdensitometers remain to be tested to complete the survey of available instruments, the [REDACTED] dual beam instrument and [REDACTED] Class I and Class III instruments. These instruments are currently in the final stages of production or modification. They will be tested as soon as they are available which should be in mid-October. STATINTL

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All of the information obtained to date pertaining to the [REDACTED] and [REDACTED] Class II microdensitometers is being incorporated into a report of the results of the survey.

A classification of the instruments is being made with emphasis on the special features of each of the instruments. The differences in the objectives for which each of the microdensitometers surveyed were designed makes a general classification based on mutual performance criteria of the instruments difficult. STATINTL

The analysis of the results of the performance tests developed at [REDACTED] have been completed. They indicate that, except for system resolution, the various microdensitometers perform as stated by each of the respective manufacturers. The discrepancies in the stated values of resolution are due to the lack of a common definition of the term and to the use of various types of test patterns in determining resolution. Data calculated from edge traces which we have obtained from the instruments will be used to compare the optical performance of the instruments.

III. Feasibility Studies

Effort on Task III has included a theoretical investigation of safe laser powers for use in microdensitometers. This investigation is desirable because the large amounts of energy provided by lasers are sufficient to damage film.

All of the microdensitometer features, which are being investigated under Tasks II and III, are being evaluated to determine their desirability in an improved microdensitometer.

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